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COVINGTON & BURLING

1201 PENNSYLVANIA AVENUE, N.W.

P.O. BOX 7566

WASHINGTON, D.C. 20044-7566

(202) 662-6000

TELEFAX: (202) 662-6291

TELEX: 89-593 (COVLING WSH)

CABLE: COVLING

KURT A. WIMMER

DIRECT DIAL NUMBER

(202) 662-5278

DOCKET FILE COPY ORIGINAL

LECONFIELD HOUSE

CURZON STREET

LONDON W1Y 8AS

ENGLAND

TELEPHONE: 071-495-5655

TELEFAX: 071-495-3101

BRUSSELS CORRESPONDENT OFFICE

44 AVENUE DES ARTS

BRUSSELS 1040 BELGIUM

TELEPHONE: 32-2-512-9890

TELEFAX: 32-2-502-1598

April 22, 1994

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

BY MESSENGER

The Hon. Reed E. Hundt
The Hon. James H. Quello
The Hon. Andrew C. Barrett
Federal Communications Commission
1919 M Street, N.W., Eighth Floor
Washington, D.C. 20554

Re: Comments on PCS En Banc Hearing and
Notification of Ex Parte PCS Task Force Meeting
Personal Communications Services, Docket 90-314

Dear Chairman Hundt, Commissioner Quello
and Commissioner Barrett:

American Personal Communications ("APC")^{1/} is today filing broad-based comments on the en banc PCS hearing held on April 11 and 12, 1994. We are writing separately to point out an important matter that was not mentioned at the hearing but also should be dealt with on reconsideration -- the need for dedicated PCS support spectrum in the 38 GHz band.

Today, J. Barclay Jones, APC's vice president for engineering and the undersigned, representing APC, and Jeffrey A. Krauss, Ph.D., Robert P. Hamblet, Jr. and Paul T. Obert, representing Microwave Radio Corporation, met with the PCS Task Force to discuss this topic. The attached materials were distributed at the meeting.

If PCS is ever to become an effective competitor to local exchange operators, it must have access to independent and effective means of connecting base stations and switching facilities. If PCS licensees are forced to rely upon leasing facilities from local exchange carriers or other companies, the ability of PCS to create spirited competition in the local loop will be significantly diminished.

^{1/} American PCS, L.P., d/b/a American Personal Communications, a partnership in which APC, Inc. is the managing general partner and The Washington Post Company is an investor/limited partner.

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Microwave frequencies at 37.0-40.0 GHz are exceptionally well-suited to this task because these frequencies are used internationally for PCS microwave backhaul. American PCS licensees would be able to benefit from economies of scale associated with global use of these frequencies. For example, the Mercury One-2-One system in England utilizes some 1,000 38 GHz links (supplied, incidentally, by an American manufacturer). Microwave links of up to three miles can be quickly and easily assembled using 38 GHz radios, at a cost that may be as low as \$10,000 as volumes increase -- a mere fraction of the cost of a microwave link in other bands. These radios also are extremely efficient in use of spectrum; one relatively narrowband path can take the place of several T-1 lines.

This issue is properly before the Commission on reconsideration. APC petitioned the Commission on May 3, 1991 to allocate spectrum in the 37.0-40.0 GHz band for dedicated PCS support spectrum.^{2/} The Commission folded APC's petition for rule making into the PCS Notice of Proposed Rule Making and sought comment on the need for dedicated PCS backhaul spectrum.^{3/} This proposal was supported by Motorola Microwave, Telesciences, Inc., QUALCOMM Inc., and Harris Corporation-Farion Division. In its Second Report and Order on PCS, the Commission declined to adopt dedicated PCS support spectrum, but stated:

We continue to believe that the spectrum already allocated for fixed microwave services is adequate to support PCS operations. . . . If it appears that the lack of dedicated spectrum or additional

^{2/} See Petition of APC for Amendment of the Commission's Rules to Allocate Spectrum for Provision of PCS and PCS Microwave, and to Create a New Subpart of the Commission's Rules to Authorize PCS as a New Service, filed May 3, 1991.

^{3/} See Amendment of the Commission's Rules to Establish New Personal Communications Services, Notice of Proposed Rule Making, 7 F.C.C. Rcd. 5676, 5681 n.7 (concerning APC's Petition) (1992); see also id. at 5697-98 (seeking comment on APC's 38 GHz proposals).

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standards on channelization are impeding the development of PCS, we will revisit this issue.^{4/}

APC asked the Commission to reconsider this decision:

APC continues to regret the Commission's decision not to allocate at least a portion of the 38 GHz band specifically for PCS backhaul. As we feared, . . . recent applications propose to consume all of the remaining 38 GHz channels in the Washington/Baltimore market and other substantial markets. Case-by-case adjudication of competing applications in the 38 GHz band in self-defined rectangular service areas is an inefficient, ineffective and delay-prone approach to the problem of congestion in these frequencies. APC urges the Commission to reconsider and adopt a partial set-aside of the 38 GHz frequencies for PCS backhaul.^{5/}

This need is especially pressing now because multiple applications for substantially all the frequencies in the 38.6-40.0 GHz band for virtually all the top U.S. markets have been filed in the past four months.

The best and most elegant solution would be for the Commission on reconsideration to adopt PCS-specific service rules for frequencies in the 37.0-38.6 GHz band, which now has no service rules and is lying fallow. As APC suggested in its 1991 petition, the service areas for this band could be consistent with PCS licensing areas. Channelization rules could be replicated from the rules applicable to the 38.6-40.0 GHz band.^{6/} If this plan is adopted, the Commission would ensure that PCS licensees have access to cost-effective and suitable backhaul frequencies. If this plan cannot be

^{4/} Amendment of the Commission's Rules to Establish New Personal Communications Services, Second Report and Order, 8 F.C.C. Rcd. 7700, 7743 (1993).

^{5/} APC, Opposition to Petitions for Reconsideration, Gen. Docket 90-314, pp. 23-24 (December 30, 1993).

^{6/} Microwave Radio Corporation is today submitting more detailed channelization rules that APC supports.

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adopted, the Commission also could establish a waiver policy under which PCS licensees would be permitted to utilize 37.0-38.6 GHz frequencies pending the Commission's adoption of rules for that band.

Please feel free to contact me or Barclay Jones (202-296-0005) with any questions concerning this matter, or if we can supply further information that would be helpful to the Commission.

Respectfully submitted,



Kurt A. Wimmer

Attorney for American
Personal Communications

Attachment

cc:	Mr. Ralph A. Haller	Michael Katz, Ph.D
	Robert M. Pepper, Ph.D	Mr. Donald H. Gips
	Mr. Gerald P. Vaughn	Mr. A. Richard Metzger
	Karen Brinkmann, Esq.	Renee Licht, Esq.
	Rudolfo Lujan Baca, Esq.	Byron Marchant, Esq.
	Thomas P. Stanley, Ph.D	David R. Siddall, Esq.
	William E. Kennard, Esq.	Peter A. Tenhula, Esq.
	Mr. David Rosston	Mr. John R. Williams
	Mr. David Reed	Mr. Ron Netro
	Mr. Fred Thomas	Mr. Rick Engleman

April 22, 1994

**The Commission Can and Should Allocate Spectrum
For PCS Microwave Support Spectrum On Reconsideration**

As the attached documents demonstrate, the issue of allocating spectrum in the 37.0-40.0 GHz band for dedicated use as PCS backhaul has been properly before the Commission since May 3, 1991, when American Personal Communications ("APC") filed its Petition for Rule Making on, *inter alia*, that topic.

- A. APC Petition for Rule Making seeking an amendment of the Commission's Rules to allocate spectrum for PCS and PCS Microwave support spectrum (May 3, 1991)
- B. FCC Notice of Proposed Rule Making, Gen. Docket 90-314, which folded APC's petition into the PCS docket (p. 5681 n.7) and sought comment on its proposal for PCS Microwave support spectrum (pp. 5697-98) (July 16, 1992)
- C. APC Comments in support of PCS Microwave allocation (pp. 63-65) (Nov. 9, 1992) (also supported by Harris Corp.-Farinon Division and QUALCOMM Inc.)
- D. FCC Second Report and Order, Gen. Docket 90-314, declining to adopt dedicated PCS support spectrum but noting that "if it appears that the lack of dedicated spectrum or additional standards such as channelization are impeding the development of PCS, we will revisit this issue" (pp. 41-42)
- E. APC Opposition preserving the PCS Microwave issue on reconsideration

ATTACHMENT A

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)

Petition of)

AMERICAN PERSONAL COMMUNICATIONS)

For Amendment of the Commission's Rules) RM- _____

to Allocate Spectrum for Provision of)

Personal Communications Services ("PCS"))

and PCS Microwave, and to Create a New)

Subpart of the Commission's Rules to)

Authorize PCS As a New Service)

AMERICAN PERSONAL COMMUNICATIONS
PETITION FOR RULE MAKING

AMERICAN PERSONAL
COMMUNICATIONS

Jonathan D. Blake
Kurt A. Wimmer
D. Scott Coward

COVINGTON & BURLING
1201 Pennsylvania Avenue, N.W.
Post Office Box 7566
Washington, D.C. 20044
(202) 662-6000

Its Attorneys

May 3, 1991

accomplish this purpose. If the cost of OFS migration is too high, the market would determine that PCS is not as valuable as the current fixed microwave scheme. But, more likely, the expected low cost of limited migrations could be absorbed by PCS licensees, making possible a smooth, equitable and speedy launch of PCS in the 1850-1990 MHz band.

V. PCS MICROWAVE

Microwave transmission paths are needed to connect the numerous base stations that will be employed in PCS systems. The United Kingdom has set aside channels in the 37-39.5 GHz band for PCS microwave. APC believes that these frequencies are also suitable in the United States for this purpose and provide adequate capacity for future growth. Equipment that can operate in a cost-effective manner with antenna dishes of less than 12 inches in diameter is now commercially available for PCS microwave use.

that is, in reality, a private auction. This approach is discussed below with other licensing issues.

APC also opposes negotiation processes with OFS users that are not limited to reimbursement of the reasonable costs of OFS relocation. Such an unfettered "marketplace" approach would permit OFS users to exploit their possession of a government-granted monopoly license to the spectrum in question and demand monopoly rents in exchange for vacating that spectrum. The unequal status of OFS users and PCS licensees in such negotiations would prevent a proper economic valuing of the spectrum. That approach's "market" value for PCS would be entirely captured by existing OFS users exploiting monopoly rights rather than the PCS entrepreneurs bringing PCS service to the public.

There are currently no service rules for the 37-38.6 GHz band. The Commission should thus proceed to adopt regulations for these frequencies that make them suitable for PCS microwave. APC believes that the 38.6-39.5 GHz band can already be used for PCS microwave in this country under existing rules, although the Commission's operational requirements for these frequencies should be reviewed and, if necessary, revised to ensure their suitability for PCS microwave use.

VI. LICENSING ISSUES

Blanket Licensing for Base Stations. Because of the microcellular nature of PCS systems, hundreds of base stations are likely to be required in all markets. To ease administrative burdens on the Commission and PCS licensees, APC proposes a system of blanket licensing to cover all of a licensee's base stations.^{26/} Such a system would require each applicant for a PCS authorization to submit a plan that would specify the number, type, emission range and potential locations of the base stations to be used to provide coverage of the licensee's market. The Commission would then issue a blanket license for the base stations specified in that plan.

^{26/} As with cellular, mobile units would be far too numerous to license individually. Mobile units would be "considered to be associated with and covered by the authorization issued to the carrier serving the land mobile station." See Attachment A (proposed amendment of Section 22.9(c)).

ATTACHMENT B

7 F.C.C. Recd.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FCC 92-333

In the Matter of) GEN Docket No. 90-314
) ET Docket No. 92-100
)
) RM-7140, RM-7175, RM-7617,
) RM-7618, RM-7760, RM-7782,
 Amendment of the Commission's) RM-7860, RM-7977, RM-7978,
 Rules to Establish New Personal) RM-7979, RM-7980
 Communications Services)
) PP-35 through PP-40, PP-79
) through PP-85

NOTICE OF PROPOSED RULE MAKING AND TENTATIVE DECISION

Adopted: July 16, 1992; Released: August 14, 1992

Comment Date: November 9, 1992
Reply Comment Date: December 9, 1992

By the Commission: Commissioner Quello concurring and issuing a statement; Commissioners Marshall and Barrett issuing separate statements.

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international allocations that recognize and permit use of this spectrum for PCS.¹ Various telecommunications companies also have been active in participating in our PCS proceedings, and over 100 companies are conducting more than 150 experiments pursuant to experimental licenses to develop and test PCS services and technologies.

Commission Actions

Petitions and Notice of Inquiry

9. This proceeding was initiated after the Commission received petitions for rule making from Cellular 21, Inc. (Cellular 21) and PCN America, Inc. (PCN America)² requesting that the Commission allocate spectrum for the implementation of new personal communication services.³ On June 14, 1990, the Commission adopted a Notice of Inquiry (Notice) soliciting comment on a broad array of issues that address making PCS available to the American public.⁴ Most commenters to the Notice support the Commission's decision to initiate a rulemaking on PCS and predict great demand for PCS services or devices such as CT-2, PCNs, wireless PBXs, wireless data transfer and advanced paging.⁵ However, incumbent users of the 2 GHz spectrum express concern that the introduction of PCS would have an adverse effect on their current operations.

¹See Report, GEN Docket No. 89-554, 6 FCC Rcd 3900 (1991); International Telecommunication Union, Final Acts of the World Administrative Radio Conference (WARC-92), Malaga-Torremolinos, 1992, and Addendum + Corrigendum to the Final Acts of the World Administrative Radio Conference (WARC-92), Malaga-Torremolinos, 1992.

²See Petitions for Rule Making, RM-7175, filed by PCN America on November 7, 1989, and RM-7140, filed by Cellular 21 on September 22, 1989.

³On April 30, 1990, the Personal Communications Section of the Telecommunications Industry Association (TIA) petitioned the Commission requesting allocation of 25 duplex channel pairs in the 46/49 MHz bands for conventional cordless telephones (CT-1). We treated the petition as a comment to the Notice of Inquiry in this proceeding. However, the Commission will consider allocating additional 46/49 MHz spectrum for CT-1 services spectrum in a separate proceeding.

⁴See Notice of Inquiry, GEN Docket No. 90-314, 5 FCC Rcd 3995 (1990).

⁵See definitions of these services at note 16, *infra*.

10. Subsequent to the Notice, the Commission received a number of related petitions that proposed new PCS services or technologies. On February 13, 1991, Apple Computer, Inc. proposed that 40 MHz from the 1850-1990 MHz band be allocated for high-speed local-area data communications services connecting personal computers (Data-PCS).⁶ Because the petition proposed a service significantly different than that addressed in the Notice, we accepted this petition and received separate comment on it. With the record before us, it appeared that the services proposed by Apple came within the PCS family of services defined in our Policy Statement, *infra*, and accordingly we incorporated the petition into this Docket when we adopted the Policy Statement.⁷ More recently, on March 26, 1992, Broadband Communications Corporation filed a petition for rulemaking proposing use of 2 GHz spectrum for competitive-access wireless local loops. We would classify wireless local loop service as a type of PCS, and because Broadband proposes use of the same spectrum being considered herein, the substance of Broadband's proposal is incorporated in this proceeding.

11. We also have received ten separate petitions for rulemaking that request using the 930-931 MHz advanced paging reserve for a variety of new applications, principally advanced paging and messaging services. These petitions have been or are being accepted, consolidated within ET Docket No. 92-100, and considered in this Notice of Proposed Rule Making.⁸ However, if

⁶RM-7618.

⁷After the PCS proceeding was initiated and comments received on the Notice, Advanced Wireless Communications, Inc. and American Personal Communications (APC) filed petitions that addressed issues already under consideration in the PCS docket (GEN Docket No. 90-314). Accordingly, both petitions were denied without prejudice, but accepted as late-filed comments and, with the other comments that address PCS issues, have been fully considered. APC filed for reconsideration, arguing that its petition merited consideration separate from that accorded the broad array of PCS issues in this proceeding. APC later agreed that its petition could be "folded into" this Notice without a separate comment period, see APC, Supplement to Petition for Rule Making, GEN Docket No. 90-314 at note 3 (filed May 4, 1992). The issues raised by APC in its petition are discussed in this Notice, and therefore its petition for reconsideration is dismissed as moot.

⁸The petitions were filed by: 1) Telocator on January 23, 1991 (RM-7617); 2) Montauk Telecommunications on June 6, 1991 (RM-7760); 3) Echo Group, L.P. on July 30, 1991 (RM-7782); 4) PacTel Paging on August 2, 1991 (advanced architecture paging, RM-7979); 5) Dial Page, L.P. on October 11, 1991 (RM-7977); 6) PacTel Paging on October 15, 1991 (ground-to-air paging, RM-7860); 7) Mobile

what restrictions, if any, the Commission should place on such negotiated arrangements.

900 MHz Allocation

48. The proposals that relate to 900 MHz include a variety of narrowband PCS services such as advanced paging, messaging, data, and CT-2. These services include one-way systems with relatively low power transmissions from a subscriber to a base station, one-way systems with relatively high power transmissions from a base station to a subscriber, and one-way services that include facsimile, graphics, and other imaging services. Also proposed are two-way systems that would provide subscribers both longer and more diverse message services than are available with current paging services, including for example, tracking and acknowledgment. In addition, two-way advanced cordless telephone service is proposed. In some respects these 900 MHz proposals are similar to some of the proposals for use of the 2 GHz band. They differ, however, in that all require only relatively narrow bandwidths for transmission, generally from 5 to 50 kHz per individual channel. Consequently, the information would be transmitted at slower rates.

49. We recognize the increasing demand for the services that reasonably and efficiently can be provided at 900 MHz. Accordingly, we propose to allocate three megahertz in the 900 MHz spectrum for narrowband PCS services: 901-902, 930-931, and 940-941 MHz. These frequencies currently are reserved for advanced paging³⁴ and general purpose mobile services.³⁵

50. The petitioners propose many types of services that have different spectrum requirements. In determining how best to divide and assign these bands, it is important to provide spectrum that will allow flexibility in the design and implementation of different and innovative systems and still allow for competition among systems. As an initial matter, we tentatively conclude that dividing the 900 MHz spectrum into both paired and unpaired blocks would provide for competitive services as well as for future flexibility. We propose, therefore, to pair blocks of spectrum from the 901-902 and 940-941 MHz bands; and to provide for unpaired use in the 930-931 MHz band. We request comment on providing both paired and unpaired spectrum at 900 MHz, and on the amount provided for each configuration.

³⁴See First Report and Order, GEN Docket No. 80-183, 47 Fed. Reg. 24577 at para. 14 (1982).

³⁵See Report and Order, GEN Docket Nos. 84-1231, 84-1233, and 84-1234 at para. 118 (1986), allocating 901-902 MHz and 940-941 MHz to a General Purpose Mobile Service.

51. As a first alternative, we propose that the size of the blocks in these bands be 50 kHz. This would provide 20 paired blocks in the 901-902/940-941 MHz band and 20 unpaired blocks in the 930-931 MHz band in each service area. This division is amenable to accommodating the proposals for advanced paging and messaging in ET Docket No. 92-100 (See Appendix C).³⁶ By providing for multiple licensees, our proposal also provides an opportunity for competition among the services. We also request comment on permitting aggregation for those providers that may need more than 50 kHz for their systems, and on whether an upper limit per provider should be required.

52. A second alternative to this plan would be to divide the 901-902 MHz and 940-941 MHz frequency bands into four paired blocks of 250 kHz each (500 KHz per pair), and to divide the 930-931 MHz band into four 250 kHz blocks. A third alternative would be to divide the 901-902 MHz and 940-941 MHz frequency bands into two paired blocks of 500 kHz each (1 MHz per pair), and to assign 930-931 MHz as a single 1 MHz block. While this would reduce the number of potentially competing systems, it would provide a greater amount of spectrum to each licensee, and thus possibly increase flexibility of use and reduce cost. We solicit comment on these proposed alternative channeling plans and on any other proposals that commenters may recommend.

PCS Support Spectrum

53. For PCS services operating in a cellular configuration, the PCS cell sites, like cellular cell sites, must be connected to a central switching node. This connecting link is commonly referred to as a "backhaul link" and could be either a wired link, such as a fiber optic cable or cable television plant, or a wireless link (radio). Additionally, there will be requirements for connecting one cell to another. These links that provide support services, if wireless, generally do not use the spectrum allocated to a service, but use different frequencies allocated for fixed microwave. Currently there are a number of fixed microwave bands that can support these requirements.³⁷ However, parties have requested that additional fixed microwave spectrum be allocated to support, *inter alia*, PCS connection requirements.

54. APC, in its filings accepted as comments in this proceeding, proposes that the 37.0-39.5 GHz band be used to

³⁶Aggregation of spectrum blocks could be accomplished in the marketplace through aftermarket sales or, if authorized, through competitive bidding.

³⁷The fixed microwave bands are 3.7-4.2, 5.925-6.425, 6.525-6.875, 6.875-7.125, 10.7-11.7, 11.7-19.7, 21.2-23.6, 27.5-29.5 and 37.0-40.0 GHz.

connect PCS base stations and that the Commission adopt a channeling plan.³⁸ APC states that the 37.0-38.6 GHz fixed microwave band currently has no licensed use, and that use of this band to support PCS would permit PCS licensees to begin service without overburdening other microwave frequencies. Similarly, the Harris Corporation has requested that we channelize the 27.5-29.5 GHz (28 GHz) band and make it available for private operations in addition to common carrier operations to support both cellular and PCS operations.³⁹ Suite 12 Group opposes the petition, stating that it would harm 28 GHz point-to-multipoint operations such as wireless cable and that unmet demand for short distance microwave links has not been demonstrated. Motorola Microwave also opposes the petition and states that it would hinder the ability of U.S. manufacturers to compete in the international market for PCS equipment, will unnecessarily raise the cost of PCS to the American public, and will make inefficient use of critical spectrum. Instead, Motorola Microwave agrees with APC that the 37-39.5 GHz band is the most appropriate for microcell interconnection and will provide the necessary capability for future growth. Also, Motorola Microwave states that any additional applications that could not be serviced by the 37-39.5 GHz band because of propagation limitations could utilize the existing, uncongested 21.2-23.6 GHz band. TeleSciences, Inc. agrees with Motorola Microwave, and adds that the 38 GHz band provides superior frequency reuse capabilities as compared to the 28 GHz band, which will be valuable in interconnecting the numerous cell sites of a PCS system.

55. We tentatively conclude that adequate spectrum already is allocated for fixed microwave to provide for PCS support services, and therefore decline to propose allocating additional spectrum for this purpose. However, we request comment focused on whether additional spectrum is required, and whether rule changes as requested by APC are needed for more efficient channeling plans in the bands already allocated for fixed microwave.

³⁸ See APC's "Petition for Rule Making," filed on May 3, 1991, its "Supplement to Petition for Rule Making," filed May 4, 1992 and its "Further Supplement to Petition for Rule Making," filed May 21, 1992. These filings have been accepted as comments in GEN Docket No. 90-314, see note 7, *supra*.

³⁹ Harris petition filed on April 19, 1991, and placed on public notice on May 15, 1991 (RM-7722). Six parties commented and there were two reply comments.

Licensing Issues

PCS Service Areas

56. 2 GHz Service Areas. In addition to determining the amount of spectrum to be assigned to each PCS licensee, the Commission also must determine the geographic scope of each license area. In creating the cellular telephone service eleven years ago, the Commission decided to license 734 metropolitan and rural service areas. However, the system that exists today has effective operating service areas that are much larger than the initial division would imply. This is for two reasons. First, because one license in each market was set aside for LECs, a *de facto* system of large, regional licenses (at least for the larger LECs) has emerged. Second, over the past few years, the cellular industry has been consolidating rapidly. A number of large cellular firms each serve substantial portions of the U.S. population (although not necessarily with contiguous service areas).⁴⁰

57. This consolidation seems to have been driven by the greater economies of scale and scope in larger cellular operations. However, high transaction costs have been incurred in achieving these economies. Such transaction costs may have been over \$100 million in 1991 alone, and total transaction costs to consolidate systems ultimately may be over one billion dollars.⁴¹ In addition, the large number of licenses initially assigned seems to have delayed unnecessarily the assignment process for cellular, perhaps by several years.

⁴⁰ See generally, "Cellular Network's Big Step," *New York Times*, October 15, 1991, p. D1.

⁴¹ In 1991, 75 MSA licenses were traded, involving cellular franchise areas with a total population of 26.4 million (pops) at an average price of \$189 per pop, and 238 RSA licenses involving 22.2 million pops at an average price of \$61 per pop. Paul Kagan Associates, *Cellular Investor*, January 21, 1992, p. 4. This implies that total transactions were \$6.3 billion. If, as is typical in this market, brokers worked on a 3% commission, sales commissions alone were \$190 million in 1991. Aggregate transactions costs would be even greater since they also include costs incurred directly by the buyers and sellers, as well as by the FCC. If only half of these transactions were related to consolidating systems, the consolidation costs would still have been about \$100 million in 1991. Since about 10% of the potential pops nationwide (for two systems) traded in 1991, if half of all pops were to trade to achieve greater geographic coverage, total transactions costs would be about one billion dollars.

ATTACHMENT C

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Amendment of the Commission's)	Gen. Docket 90-314
Rules to Establish New)	
Personal Communications Services)	

COMMENTS OF
AMERICAN PERSONAL COMMUNICATIONS

Mr. J. Barclay Jones
Vice President for
Engineering

Jonathan D. Blake
Kurt A. Wimmer
Ellen K. Snyder
Nancy-Ann E. Min

AMERICAN PERSONAL
COMMUNICATIONS
1025 Connecticut Ave., N.W.
Washington, D.C. 20036
(202) 296-0005

COVINGTON & BURLING
1201 Pennsylvania Avenue, N.W.
Post Office Box 7566
Washington, D.C. 20044
(202) 662-6000

Attorneys for
American Personal Communications

November 9, 1992

F. PCS Microwave

APC has proposed a PCS microwave service to connect base stations in the 37.0-40.0 GHz band. This proposal would permit the 37-38.6 GHz band, which currently has no licensed use, and the 38.6-40.0 GHz band, which is subject to uses similar to and complementary with APC's proposed use, to be used for connection of PCS base stations. This proposal would permit PCS licensees to begin service without overburdening other microwave frequencies.

In September 1991, APC implemented the first microwave transmission in the United States in the 38.0 GHz band to connect base stations and transmit data over a 2.8 mile path.^{90/} APC's experimental activities have validated the reliability of this method of backhaul, which will be an important adjunct to PCS system design because of its eventual low cost, the small size of its antenna system (less than 24 inches in diameter), and its ease of installation.^{91/}

APC believes it would be a mistake for the Commission to fail to authorize a specific bank of microwave frequencies for PCS backhaul.^{92/} First, failure to set aside a specific band for PCS microwave use could result in

^{90/} See APC, Fifth Progress Report at 11.

^{91/} In addition, APC is experimenting with the use of traditional telephone plant leased lines for backhaul as well as with the use of a fiber optic infrastructure.

^{92/} See Notice at ¶ 55.

insufficient spectrum in the 37-39.5 GHz band being available for PCS backhaul. In one of the largest markets in the United States, for example, APC understands that one company recently has applied for a full 600 MHz of contiguous spectrum in the 38.6-40.0 GHz band. Other companies may be expected to follow suit in other major markets in an early attempt to control frequencies needed for PCS backhaul. Reserving some portion of the band for each PCS licensee would ensure that frequencies remain available.

Second, the current rules for the 38.6-40.0 GHz band are predicated on the licensing of rectangular service areas. These service areas are not well suited to major trading areas or to other potential PCS service areas under consideration. Because channel assignments are exclusive, overlapping of rectangular service areas would cause unnecessary channel preclusion; these service areas are spectrally inefficient. Conforming PCS Microwave licensing areas to PCS service areas, in contrast, would be an efficient use of spectrum.

Third, the United Kingdom has allocated the entire 37.0-39.5 GHz band for PCN microwave use. International use of the 37-39.5 GHz band for PCS backhaul will result in significant economies of scale and in a high degree of equipment availability. These economies will permit PCS to be inaugurated more efficiently and permit PCS licensees to pass on cost savings to their subscribers.

APC suggests that the Commission allocate spectrum in the 37.0-39.5 GHz band for a PCS microwave service consistent with APC's proposals.

G. Licensing Restrictions

APC opposes restrictions on the number of PCS licenses any one entity may hold (except, of course, in the same market). There is no record of undue concentration in this new industry that would warrant imposition of such restrictions, rendering them entirely unnecessary, at least at the outset. Within each PCS market and across markets there will be healthy competition between PCS licensees and among PCS licensees and other service providers (such as cellular, LECs and paging service operators). The Commission may find it necessary in the future to impose restrictions on the number of licenses that can be held by any one entity, but that decision should be made based only after sound evidence of concentration that may lead to a substantial lessening of competition appears. Moreover, limitations of this type would preclude innovative companies from taking advantage of significant economies of scale and scope. Thus, imposing artificial restrictions will actually stifle efficiency, causing reductions in price and output of services.

One restriction that APC supports is a license holding period. APC proposes that the Commission adopt an antitrafficking provision that would prohibit a PCS licensee

ATTACHMENT D

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FCC 93-451

In the Matter of)
)
Amendment of the Commission's) GEN Docket No. 90-314
Rules to Establish New Personal)
Communications Services) RM-7140, RM-7175, RM-7618

SECOND REPORT AND ORDER

Adopted: September 23, 1993; Released: October 22, 1993

By the Commission: Commissioner Barrett dissenting and issuing a statement; Commissioner Duggan issuing a statement.

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terminals) of the device or system will be prevented from transmitting if those parts leave the coordinated area around the base station.

92. On September 13, 1993, Apple submitted an "Emergency Petition" addressing a number of issues related to operation and introduction of unlicensed PCS devices in the 2 GHz band. Apple's petition was filed three days before our "Sunshine Rules" resulted in cutting off all comment on the proceeding as a whole, including on the Apple petition.⁸⁰ Consequently, many parties did not have an opportunity to file comments supporting or opposing the petition.⁸¹ We agree with Apple that the early introduction of nomadic PCS devices is desirable, and therefore that it is in the public interest to obtain public comment on the petition in order that we may be fully informed by all interested parties on these issues. Accordingly, by Public Notice we will solicit comment in response to the Apple petition. Further, we are delaying the effective date of rules related to Apple's petition for an additional thirty days to permit full consideration of the issues raised by Apple.

3. PCS Support Spectrum

93. In cases where a PCS system would operate in a cellular configuration, the PCS cell sites, like cellular cell sites, must be connected to a central switching node. The communications path used to make this connection is commonly referred to as a "backhaul link" and could be either a wired link, such as fiber optic cable or cable television plant, or a radio link. In such PCS systems, there will also be similar requirements for connecting one cell to another. Where these supporting communications links operate on wireless facilities, they generally do not use the spectrum allocated to the mobile service, but instead use frequencies allocated for fixed microwave. Currently there are a number of frequency bands allocated to fixed microwave service that can support requirements for mobile service backhaul links.⁸²

⁸⁰ 47 C.F.R. § 1.1203 et seq.

⁸¹ In response to Apple's petition, comments were filed by UTC, API and the Business Software Alliance.

⁸² This approach will ensure that incumbent microwave licensees will not be subject to unexpected displacement, and is consistent with the plan we adopted for relocating fixed microwave stations in the emerging technologies proceeding, see Third Report and Order and Memorandum Opinion and Order, supra note 10. Under those rules, incumbent fixed microwave operations cannot be involuntarily relocated for a period of two years from

94. In the Notice, we tentatively concluded that adequate spectrum is already available to provide fixed microwave support for PCS services and therefore declined to propose allocating additional spectrum for that purpose. We requested comment, however, on whether additional spectrum is needed for PCS support operations and on whether rule changes requested by APC are needed to provide for more efficient channeling plans in the bands already allocated for fixed microwave service.

95. The majority of the commenting parties do not address our tentative conclusion that adequate spectrum is already allocated to the fixed microwave service. APC, Harris Corporation-Farion Division (Harris), and Qualcomm propose setting aside specific bands for PCS support services. APC recommends that the 37.0-39.5 GHz band be made available for the connection of PCS base stations.⁸³ APC believes that it is important to authorize specific frequencies for PCS backhaul operations. APC points out that this allocation would be consistent with the allocation provided in the United Kingdom to support services similar to PCS.⁸⁴ Harris recommends that the 27.5-29.5 and the 37.0-38.6 GHz bands be channelized to accommodate PCS support services. Qualcomm supports rule changes to the 37.0-38.6 GHz allocation to accommodate PCS support services. These parties argue that their proposals would permit PCS licensees to begin service without overburdening other microwave frequencies.

96. We continue to believe that the spectrum already allocated for fixed microwave services is adequate to support PCS operations. As we observed in the Notice, many of these support operations can be provided through facilities such as fiber optics, wireline telephone services and coaxial cable, that do not require use of radio. Accordingly, we are not allocating additional spectrum to support PCS operations at this time. If it appears that the lack of dedicated spectrum or additional standards such as channelization are impeding the development of PCS, we will revisit this issue.⁸⁵

the date the Commission first begins accepting applications for use of the spectrum.

⁸³ The 37.0-38.6 GHz band is allocated to the fixed and mobile services for both Government and non-Government use.

⁸⁴ The United Kingdom has allocated the entire 37.0-39.5 GHz band to these uses.

⁸⁵ It should also be noted that we do not have sufficient information or record to determine an appropriate channelization scheme for spectrum supporting PCS operations. We further note that an appropriate channelization plan may be dependent on the

ATTACHMENT E

In the Matter of)
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Amendment of the Commission's) Gen. Docket 90-314
Rules to Establish New)
Personal Communications Services)

December 30, 1993